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BEST PROXMITY POINT FOR CERTAIN NONLINEAR CONTRACTIONS IN MENGER PROBABLISTIC METRIC SPACES

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Abstract. Let A and B be nonempty subsets of a Menger probabilistic metric space with no common point and $h\colon A \to B$ be a non-self mapping. Taking into account the fact that given any element $x \in A$, $F_{x,hx}(t)$ can be at most $F_{A,B}(t)$, for all $t > 0$, the best proximity point theorems establish a global maximum of function $x \mapsto F_{x,hx}(t)$, for all $t > 0$ by imposing an approximate solution of the equation $hx = x$. In this article we derive best proximity point theorems for some non-self mappings and some cyclic mappings with special conditions and then we give suitable examples to display the validity of hypotheses of our results.

REFERENCES

[1] O. Acar, G. Durmaz and G. Minak: *Generalized multivalued F-contractions on complete metric spaces*, Bull. Iranian Math. Soc., **40**(2014), No. 6, 1469-1478.
[2] J. Anuradha and P. Veeramani: *Proximal pointwise contraction*, Topology Appl., **156**(2009), No. 18, 2942-2948.
[3] S. Sadiq Basha and P. Veeramani: *Best proximity pairs and best approximations*, Acta Sci. Math. (Szeged), **63**(1997), No. 1, 289-300.
[4] M. Gabeleh: *Best proximity point theorems for single-and set-valued non-self mappings*, Acta Math. Sci. Ser. A Chin. Ed., **34**(2014), No. 5, 1661-1669.
[5] W.K. Kim, S. Kum and K.H. Lee: *On general best proximity pairs and equilibrium pairs in free abstract economies*, Nonlinear Anal., **68**(2008), No. 8, 2216-2227.
[6] K. Menger: *Statistical metrics*, in Proc. of the National Academy of Sciences of the United States of America, **28**(1942), No. 12, 535.
[7] D. O'Regan and R. Saadati: *Nonlinear contraction theorems in probabilistic spaces*, Appl. Math. Comput., **195**(2008), No. 1, 86-93.
[8] A. Razania and N. Karamikabir: *Proximal pairs and PKKM mappings*, Commun. Nonlinear Anal., **1**(2016), No. 1, 37-41.
[9] R. Saadati: *Generalized distance and fixed point theorems in partially ordered probabilistic metric spaces*, Mat. Vesnik, **65**(2013), No. 1, 82-93.
[10] B. Schweizer and A. Sklar: *Probabilistic Metric Spaces*, Elsevier Science, New York, 1983.
[11] P.S. Srinivasan and P. Veeramani: *On best proximity pair theorems and fixed-point theorems*, Abstr. Appl. Anal., **2003**(2003), No. 1, 33-47.
[12] C. Vetro and P. Salimi: *Best proximity point results in non-Archimedean fuzzy metric spaces*, Fuzzy Inf. Eng., **5**(2013), No. 4, 417-429.

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